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EXAMINER

LUM, LEE S

ART UNIT PAPER NUMBER

3611

DATE MAILED: 12/11/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/990,741

Applicant(s)

BOLOORCHI ET AL.

Examiner

Ms. Lee S. Lum

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 17 June 2003.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-23 and 26-28 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-8, 12-18, 21, 22 and 26-28 is/are rejected.
- 7) ☒ Claim(s) 9-11, 19, 20 and 23 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☒ The proposed drawing correction filed on 09 October 2003 is: a) ☒ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 12.
- 4) ☐ Interview Summary (PTO-413) Paper No(s). _____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____.

DETAILED ACTION

1. An Amendment was filed 10/9/03 which also added Claim 28. An IDS was filed 11/12/03.

2. The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

Claims 1-5, 13 and 28 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention.

As best understood, pp 3-4 do not sufficiently describe a "motor position" with respect to the recitations in Claims 1, 13 and 28, and that on p 3, of "a difference between a desired motor position, and an actual position". It is unclear exactly what element of the electric motor is supposed to have positions ("desired" vs. "actual") to measure. As known, an electric motor has at least one moving part – the rotor - whereas the steering system including the motor, rack-and-pinion, steering gear mechanism, etc, as well as driver inputs, such as steering angle, steering torque, etc, obviously each have a multitude of moving parts. Within this context, it is unclear what is meant by "motor position". To address this issue, the spec must be amended to include an adequate description of the excerpted language, but no new matter is permitted.

3. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claims 1-5, 13 and 28 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

In Claims 1, 13 and 28, the language "a difference between a desired motor position, and an actual position" is unclear because it is unknown exactly what element of the electric motor is supposed to have positions ("desired" vs. "actual") to measure, as discussed in paragraph 2 above. These Claims must be clarified/amended to render a clear understanding of the invention.

4. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

As best understood, **Claims 1, 5-8, 13, 27 and 28** are rejected under 35 U.S.C. 102(b) as being anticipated by Collier-Hallman et al 6122579.

As best understood, re **Claims 1 and 5**, Collier-Hallman discloses a method (fig 7) for controlling a feel-back torque of a motor 46, the steps comprising

As best understood, receiving a signal of the difference between desired, and actual, motor positions (col 2, lines 52-54),

Filtering the signal into frequency bands via filter 120 (col 5, lines 45-57, as one of several signals provided to the controller, as disclosed in col 2, lines 45-52), and,

Applying a scheduled gain 128 to at least one band corresponding with a low-pass portion of the signal.

Re **Claims 6 and 27**, the reference further discloses a controller 16 for an active steering system comprising

Feel control algorithm (fig 7, and col 5, lines 33-57) for controlling a feel back torque, the algorithm comprising filter 120, and at least one of a high-pass gain, and a low-pass gain (result from gain scheduler 128),

wherein at least one of the gains (here, low-pass gain) operates on a high-pass/low-pass portion (here, low-pass portion) of an error signal (signal from torque sensor 28).

Re **Claim 7**, the reference further discloses at least one of the gains as comprising Scheduling table 128 which is indexed on the error signal (element 128 in fig 3, and col 4, lines 4-7; "gain factor...as a function of the magnitude IMAG of I-sub damped", lines 60-end, and continuing to col 5, line 5).

Re **Claim 8**, the reference further discloses the scheduling table as further indexed on a vehicle state estimate (i.e., velocity on line 14, col 2, line 45-47).

Re **Claim 13**, the reference further discloses a controller for an active steering system comprising the elements described above.

As best understood, re **Claim 28**, the reference discloses the error signal as indicative of difference between desired, and actual, motor positions (col 2, lines 52-54),

5. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

Claims 16-18 are rejected under 35 U.S.C. 102(e) as being anticipated by Phillips
6370459.

Phillips discloses an active steering system 710 comprising
Input device 12 communicating with differential actuator 712 (including reduction gearing
722),

Steering actuator 16 communicating with the differential actuator,
Feel controller 32a communicating with these components,
Wherein the differential actuator comprises

Motor 26 communicating with the controller, and,

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The differential unit disposed relative to the motor, input device, and steering actuator (fig 1), and provides a steering angle to the steering actuator that is substantially independent from an input from the driver (col 26, lines 14-21).

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

6A. **Claims 4 and 12** are rejected under 35 U.S.C. 103(a) as being unpatentable over in view of Collier-Hallman alone.

Re **Claim 4**, the reference does not disclose the gain as variable, but this feature is clearly application-specific according to desired results. However, it would have been obvious to one with ordinary skill in the art at the time the invention was made to include this characteristic for those applications in which a variable gain is desired. It is very well-known that gain is applied in signal processing towards particular objectives.

Re **Claim 12**, Collier-Hallman does not disclose a first-order filter, but this feature is application-dependent. However, it would have been obvious to one with ordinary skill in the art at the time the invention was made to include this particular filter to produce a desired/predicted result. It is extremely well-known to use filters of a specific order to produce an expected result in signal processing.

6B. **Claims 2, 3, 14, 15 and 26** are rejected under 35 U.S.C. 103(a) as being unpatentable over in view of Collier-Hallman in view of Yamauchi 6135233.

Re **Claims 2 and 3**, Collier-Hallman does not disclose motor 46 as disposed relative to a differential, while Yamauchi shows this component 100. It would have been obvious to one with ordinary skill in the art at the time the invention was made to include this element, as shown in Yamauchi, to provide a variable gear ratio for the steering system. This type of component is well-known in power-steering systems.

Re **Claims 14 and 15**, Collier-Hallman discloses a method for actively controlling the steering of a vehicle, the steps comprising

Receiving an operator input via steering wheel 26,

Receiving a stability input indicative of a dynamic stability of the vehicle (e.g., velocity and pinion angle as disclosed in col 2, lines 46-47),

Calculating a correction signal in accordance with the operator input and stability inputs (via controller 16 as exemplified in fig 2), and,

Filtering the signal into frequency bands, and applying a gain to one of the bands (col 5, lines 45-57).

The reference does not disclose adjusting the result from the gain application as an input to a differential actuator, while Yamauchi shows

Differential actuator 100 receiving an adjusted input from motor 114 (col 5, lines 36-45), in order to adjust a steering angle of steering actuator 21/22 via output shaft 20.

It would have been obvious to one with ordinary skill in the art at the time the invention was made to include this step in modifying a signal, and to apply the result to another component, as shown in Yamauchi, as an embodiment of the invention which features a variable gear ratio actuator, for different applications.

Re **Claim 26**, Collier-Hallman, in view of Yamauchi, discloses an active steering system comprising the structure and means provided above.

6C. **Claims 21 and 22** are rejected under 35 U.S.C. 103(a) as being unpatentable over Phillips in view of Collier-Hallman.

Phillips does not disclose the controller as including high-pass/low-pass gain functions, while Collier-Hallman shows these functions in col 5, lines 54-57. While Phillips includes gain functions (e.g., in figs 12), the reference does not specify the use of filters, which is extremely well-known in signal processing, and so may be implied in the disclosure. Nevertheless, it would have been obvious to one with ordinary skill in the art at the time the invention was made to include these functions, as shown in Collier-Hallman, to illustrate one means by which torque characteristics may be calculated for further processing towards feedback to the power steering system. It is extremely well-known to employ filters and gain/amplifier functions, among other various components, in signal processing, so it is understood that they would not be specified in each and every reference.

7. **Claims 9-11, 19, 20 and 23** are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Prior art does not disclose a controller for an active steering system comprising, *inter alia*, a non-linear high-pass, or low-pass, function, an absolute value function, summing function that provides an input to a high-pass gain function. Nor does prior art disclose an active steering system including, *inter alia*, a differential unit including first and second gears, each meshed with input, and output, gears, respectively.

8. **RESPONSE TO REMARKS**

With respect to pp 7-8, and Collier-Hallman, Examiner has raised an issue with the recitation in Claims 1, 13 and 28, of "a difference between a desired motor position, and an actual position" because it is unclear exactly what element of the electric motor is supposed to have positions ("desired" vs. "actual") to measure. See paragraphs 2 and 3 above. Neither the spec nor the relevant Claims adequately describe the excerpted language, thus rendering the invention unclear. Therefore, until this issue is resolved, Collier-Hallman arguably obviates the relevant Claims.

Re p 8 (bottom) to p 9 (top), Applicant argues that the reference further fails to disclose “an active steering system”, and “a feel control algorithm for controlling a feedback torque to a driver”. Examiner notes these are not limitations, but are portions of the preamble of the respective Claims. Therefore, each phrase is of minimal importance, and because the reference discloses the recited limitations (i.e., within the body of the claim), the rejections are maintained.

On pp 9-10, re Phillips, Applicant argues that Phillips’ “differential actuator” fails to obviate this recited element in Claims 16 and 17. Examiner rebuts that the reference does in fact disclose this component, as recited, and Applicant’s remarks including “This is not the same as the differential as claimed...it does not operate as a differential actuator either...” are irrelevant because this specificity is not provided in the Claims. It is noted that Applicant (re)asserts that the reference does not disclose this particular element, but does not explain why Phillip’s “speed reduction means” and “gear reduction means” do not obviate this limitation. These components are clearly “differential actuators”, which is exactly recited in these Claims, and nothing more. It is maintained Phillips discloses other elements in the relevant Claims, as provided above. (This issue was raised in the previous Response, and Examiner reiterates her rebuttal.)

Lastly, on pp 10-12, Applicant makes sweeping objections to the remaining rejections with “the Examiner mischaracterizes the disclosure of [the prior art]”. Applicant provides specific rebuttals from the bottom of p 11, to the top of p 12, re Collier-Hallman and Yamauchi. However, Applicant does not specifically indicate why the particular reference fails to disclose the particular element, but simply asserts that it does not.

Re the issues raised in the last two paragraphs above, it appears that Applicant is arguing a very literal interpretation of claim language. That is, Applicant proposes that because the respective reference does not exactly state “differential actuator”, or “stability input”, for example, it fails to obviate these limitations. But, it is obvious that this assertion is erroneous, and is NOT what is meant by “plain meaning” (as argued on p 9), nor by the rules and definitions provided in the MPEP and CFR. On the contrary, Examiner reiterates that the claim

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language has been interpreted as stated (as previously indicated), and the references clearly disclose the relevant elements.

9. Communication with the Examiner and USPTO

Any inquiry concerning this communication should be directed to Ms. Lum at (703) 305-0232, 9 am-6 pm, M-F. Our fax number is (703) 872-9306. Any inquiry of a general nature, or relating to the status of this application/proceeding should be directed to Customer Assistance at (703) 306-5771.

Ms. Lee S. Lum
Examiner
12/5/03

A handwritten signature in black ink, appearing to be 'Lum' with a stylized flourish at the end.